

Air Education and Training Command

Sustaining the Combat Capability of America's Air Force



U.S. AIR FORCE

Occupational Survey Report AFSC 2A7X3 Aircraft Structural Maintenance

**Lt Bryan Pickett
Jun 04**

Integrity - Service - Excellence

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Executive Summary



- Four clusters and four independent jobs identified during analysis
- Technical tasks are performed primarily by 3- and 5-skill-level members
- 7-skill-level members perform mix of technical and supervisory tasks
- Majority of 3-, 5-, and 7-skill-level members are in technical jobs
- Career ladder document supported by survey data
- Job satisfaction indicators are fair



Survey Background



- Last Occupational Survey Report (OSR) – October 2000
- Current survey developed – May 2003 - January 2004
 - Pensacola NAS FL (Tech School)(8)
 - Travis AFB CA (4)
 - McChord AFB WA (4)
 - Barksdale AFB LA (3)
 - Nellis AFB NV (5)
 - Holloman AFB NM (3)
 - Whiteman AFB MO (3)





Survey Background



- Survey initiated to obtain data to:
 - Evaluate current classification and training documents
 - Support promotion test development
- Current survey data collected – January - March 2004
- Components surveyed:
 - Active Duty: 3-, 5-, 7-, and 9-Skill Levels
 - Guard: 3-, 5-, 7-, and 9-Skill Levels
 - Reserve: 3-, 5-, 7-, and 9-Skill Levels





Survey Sample Characteristics



	<u>AD</u>	<u>AFRC</u>	<u>ANG</u>	<u>Total</u>
Assigned*	3,001	947	950	4,898
Mailed Out	2,642	862	886	4,390
Sample	1,586	280	318	2,184
Usable Returns	60%	32%	36%	50%

- Average time in career field for AD: 7 yrs 6 mos
- Average TAFMS for AD: 8 yrs 0 mos
- Percent of AD in first enlistment: 40%






* Assigned as of Jan 04



Paygrade Characteristics



Paygrade Distribution

		Assigned*	Sample	
	E-1 - E-2 -	5%	1%	
	E-3 -	18%	17%	
	E-4 -	18%	18%	
	E-5 -	24%	27%	
	E-6 -	23%	24%	
	E-7 -	11%	12%	
	E-8 -	**	**	

* Assigned as of Jan 04

** Indicates less than 1%



Command Representation



Command	Assigned %*	Sample %
ACC	24	28
AMC	9	11
AFMC	5	9
PACAF	8	8
AETC	9	7
USAFE	4	6
AFSOC	3	4
ANG	19	14
AFRC	19	13

* Assigned as of Jan 04



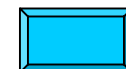
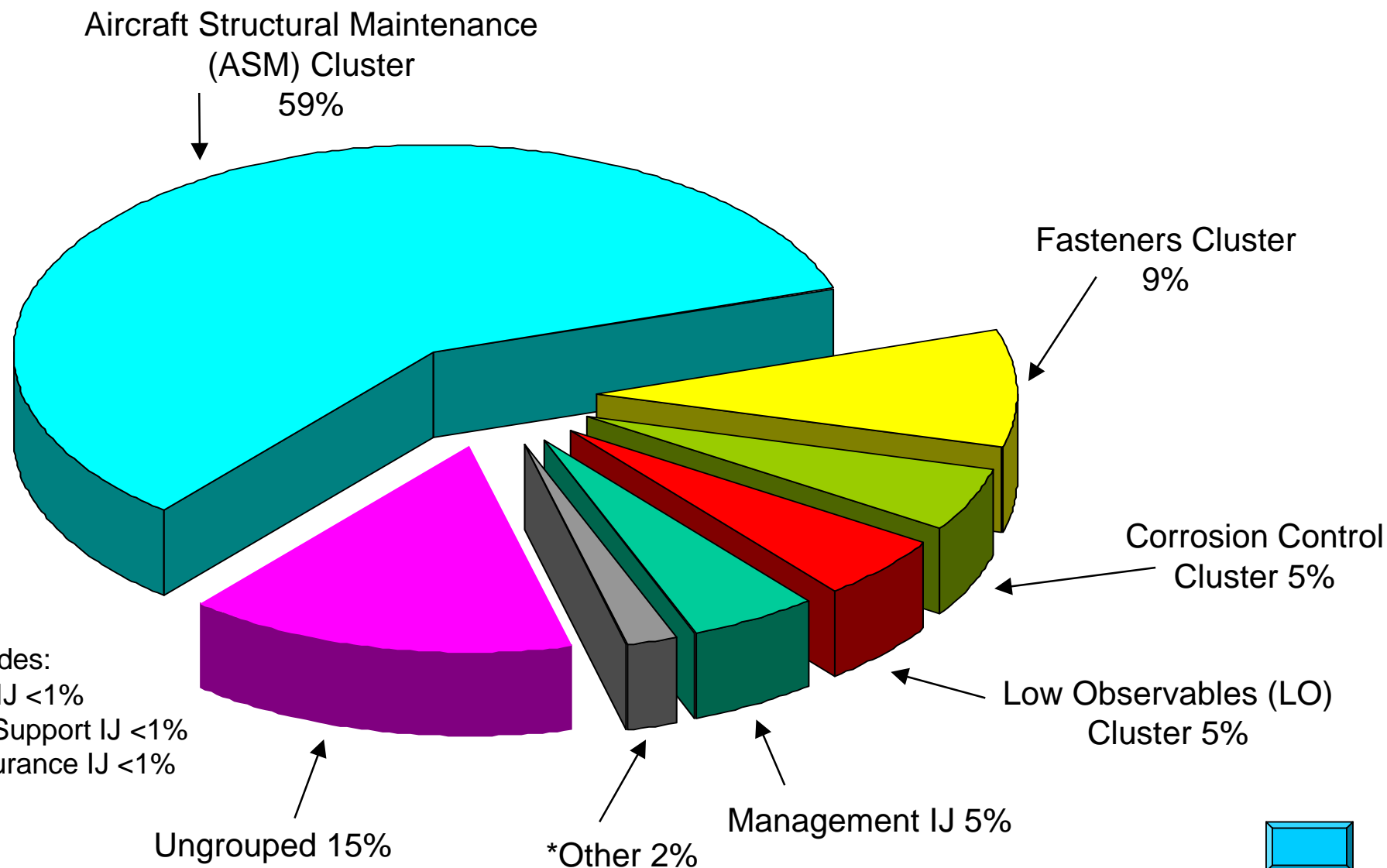
Job Structure



AETC

IJ =Independent Job

Sample size: 2,184

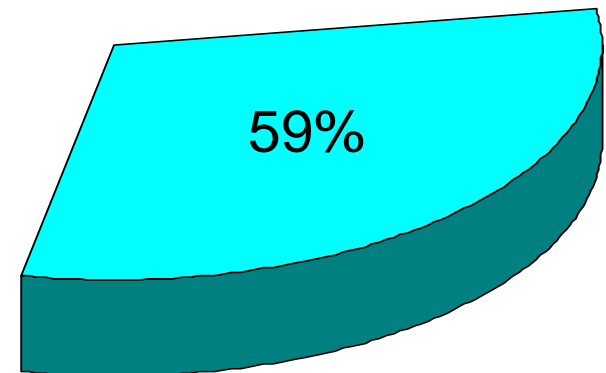




Aircraft Structural Maintenance Cluster (N=1,280)



- Drill fastener holes
- Countersink fastener holes
- Inspect fastener holes
- Inspect installed rivets
- Cut rivets
- Cut and trim sheet metal
- Inspect fasteners for proper installation
- Remove damaged areas by chain drilling
- Install or remove hi-lok fasteners
- Fabricate repair parts
- Perform nonflush skin repairs

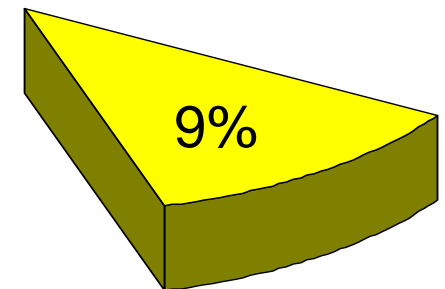




Fasteners Cluster (N=193)



- Countersink fastener holes
- Drill fastener holes
- Inspect fastener holes
- Inspect installed rivets
- Inspect fasteners for proper installation
- Cut rivets
- Cut and trim sheet metal
- Install or remove pull-through blind rivets
- Fabricate repair parts
- Align rivet or special fastener holes
- Install or remove aircraft bolts

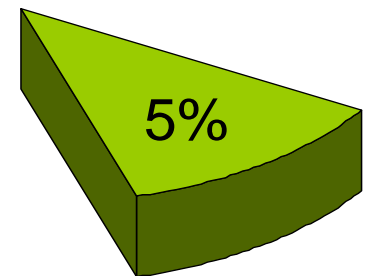




Corrosion Control Cluster (N=114)



- Apply masking materials to surfaces
- Prepare surfaces by hand sanding
- Apply stencil markings to aircraft or support equipment
- Apply or remove decals to or from aircraft or support equipment
- Prepare surfaces using media blasters
- Remove masking materials from surfaces
- Clean personal protective equipment
- Fabricate stencils by computer
- Wipe down surfaces prior to painting
- Prepare surfaces using pneumatic tools
- Set up spray equipment

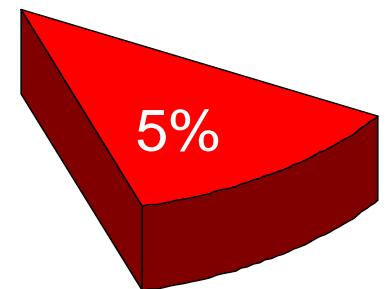




Low Observables (LO) Cluster (N=107)



- Cut LO materials
- Mix LO adhesives
- Cure low observable (LO) materials
- Apply masking materials to surfaces
- Lay out LO materials
- Dispose of LO materials
- Apply aerodynamic smoothing compounds
- Apply fillers
- Prepare surfaces by hand sanding
- Remove masking materials from surfaces
- Apply fairing compounds

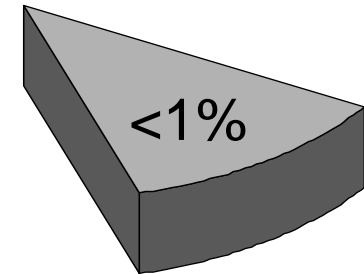




Crew Chief IJ (N=14)



- Participate as aircraft tow team member or supervisor
- Launch or recover aircraft
- Position or remove aircraft chocks
- Position aerospace ground equipment (AGE)
- Remove or install aircraft doors or panels
- Service aircraft hydraulic systems
- Perform postflight inspections
- Perform preflight inspections
- Remove or install aircraft wheel and tire assemblies
- Service aircraft tires

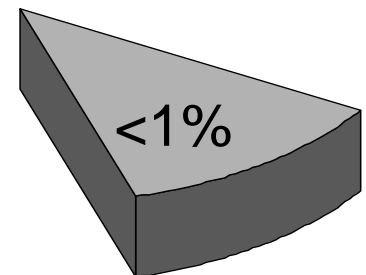




Equipment Support IJ (N=14)



- Inventory consolidated tool kits (CTKs)
- Issue or log turn-ins of equipment, tools, parts, or supplies
- Inspect or clean sheet metal hand tools
- Inventory equipment, tools, parts, or supplies, other than CTKs
- Inspect or clean sheet metal shop equipment
- Evaluate serviceability of equipment, tools, parts, or supplies
- Maintain documentation on items requiring periodic inspections or calibrations
- Pick up, deliver, or store equipment, tools, parts, or supplies

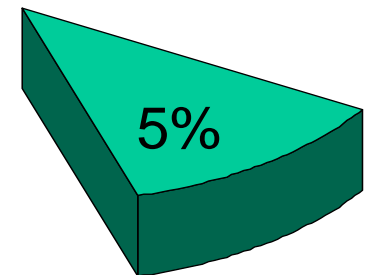




Management IJ (N=116)



- Counsel subordinates concerning personal matters
- Conduct supervisory performance feedback sessions
- Assign personnel to work areas or duty positions
- Determine or establish work assignments or priorities
- Write recommendations for awards or decorations
- Write or indorse military performance reports
- Counsel trainees on training progress
- Conduct self-inspections or self-assessments
- Conduct supervisory orientations for newly assigned personnel

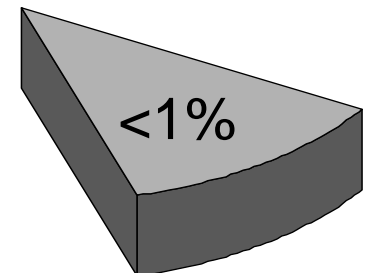




Quality Assurance IJ (N=10)



- Inventory consolidated tool kits (CTKs)
- Inspect or clean sheet metal hand tools
- Inspect emergency showers
- Inspect emergency eyewashers
- Inspect fire extinguishers
- Complete accident or incident reports
- Compile data for records, reports, logs, or trend analyses
- Inspect or clean sheet metal shop equipment
- Inventory equipment, tools, parts, or supplies, other than CTKs
- Inspect or clean coating shop equipment
- Inspect installed rivets





Career Ladder Progression



- 3- and 5-skill-level personnel
 - Work in the most technical jobs in the career field
 - Spend most of their time on technical tasks
- 7-skill-level personnel
 - Take on some supervisory duties
 - However, continue to perform technical tasks and work in technical jobs
- 9-skill-level personnel
 - Perform more supervisory duties than 3-, 5- and 7-skill levels





Percent Across Specialty Jobs

DAFSC



	DAFSC 2A733 (N=377)	DAFSC 2A753 (N=718)	DAFSC 2A773 (N=1,084)	DAFSC 2A793 (N=5)
Aircraft Structural Maintenance (ASM) Cluster	53	60	60	20
Fasteners Cluster	11	11	7	0
Corrosion Control Cluster	9	7	3	0
Low Observables (LO) Cluster	7	5	4	0
Crew Chief IJ	0	*	1	0
Equipment Support IJ	1	1	*	0
Management IJ	0	*	10	40
Quality Assurance IJ	0	*	1	0
Not Grouped	19	15	13	40

* Less than 1%



Career Ladder Progression

Percent Time Spent on Duties



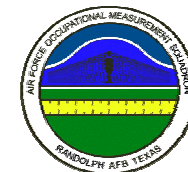
	DAFSC 2A733 (N=377)	DAFSC 2A753 (N=718)	DAFSC 2A773 (N=1,084)	DAFSC 2A793 (N=5)
Performing General Aircraft Structural Maintenance Activities	14	12	9	3
Performing General Aircraft or Support Equipment Inspections	5	6	5	5
Performing Environmental or Safety Activities	10	8	7	4
Repairing or Replacing Transparent Plastics	1	1	1	1
Maintaining Aircraft Tubing or Tubing Assemblies	5	5	4	*
Installing or Removing Fasteners	14	15	12	4
Repairing, Modifying, or Fabricating Metal Parts or Assemblies of Airframe Structures	16	17	15	4
Performing Conventional Composite Repairs	4	4	4	*
Performing Advanced Composite Repairs	2	2	1	0
Removing Corrosion or Protective Coatings	4	3	2	0

* Less than 1%



Career Ladder Progression

Percent Time Spent on Duties



	DAFSC 2A733 (N=377)	DAFSC 2A753 (N=718)	DAFSC 2A773 (N=1,084)	DAFSC 2A793 (N=5)
Performing Sealing or Sealant Activities	4	4	4	1
Applying Protective Coatings	7	5	3	*
Performing Maintenance on Low Observable (LO) Materials	5	4	2	*
Performing Maintenance Management Activities	1	2	5	13
Performing General Administrative and Technical Order (TO) System Activities	*	1	2	5
Performing Supply and Equipment Activities	5	5	6	3
Performing General Aircraft or Cross Utilization Training (CUT) Activities	*	2	3	4
Performing Mobility and Contingency Activities	*	1	2	7
Performing Training Activities	*	2	4	11
Performing Management and Supervisory Activities	*	1	9	33

* Less than 1%



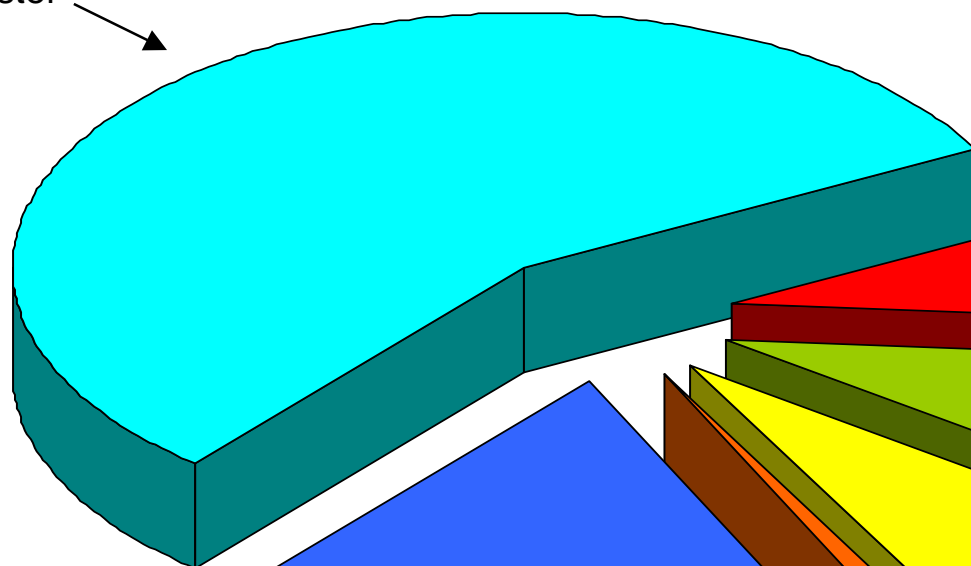
First-Enlistment Job Structure



AETC

Sample size: 616

Aircraft Structural Maintenance
(ASM) Cluster
56%



Fasteners Cluster
9%

Corrosion Control
Cluster
9%

Low Observables
(LO) Cluster
7%

Equipment
Support IJ
<1%

Ungrouped
18%



First-Enlistment Personnel Representative Tasks



Tasks

	Percent Members Performing (N=616)
Drill fastener holes	78
Countersink fastener holes	77
Inspect installed rivets	73
Apply masking materials to surfaces	72
Inspect fastener holes	71
Cut rivets	70
Cut tubing	67
Prepare surfaces by hand sanding	66
Cut and trim sheet metal	65
Inspect fasteners for proper installation	65
Wipe down surfaces prior to painting	64
Apply corrosion preventive compounds (CPCs)	61
Remove masking materials from surfaces	61
File or sand tubing	61



First-Enlistment Personnel Aircraft Maintained



<u>Aircraft</u>	<u>Percent Members Performing (N=616)</u>
C-130E/H/J	21
F-15C/D	19
F-16C/D	19
A-10	14
F-15E	14
KC-135	12
F-16A/B	9
B-2A	8
C-17A	7
C-5	7
MH/HH-60G	6
B-52H	5
E-3B/C	5
F-15A/B	5
MH-53J/M	5



First-Enlistment Personnel Equipment/Tools Used



<u>Equipment/Tool</u>	<u>Percent Members Performing (N=616)</u>
Abrasive Discs	87
Bucking Bars	71
Abrasive Papers or Cloths	69
Cleco Tools, other than Pneumatic	69
Abrasive Wheels	68
Brushes, Acid	67
Gloves, Rubber	66
Drills, Pneumatic	65
Flashlights	63
Metals, Aluminum	63
Microshavers	63
Apex Bits	62
Mixing Sticks	62
Abrasive Mats	59
Box and Pan Brake Machines	59
Cutters, Rivet	59



Specialty Training Standard (STS) Analysis



- STS is supported by survey data
- Several STS items were unsupported
 - STS items coded 2b with less than 20 percent of members
- Several STS items may need proficiency code review
 - STS items matched to JI tasks performed by more than 20 percent of members
- Several technical tasks performed by 20 percent or more of members were not referenced to STS
 - These should be reviewed for possible inclusion in STS





Unsupported STS Elements



Examples

Unit	Learning Objective	Prof Code	Percent Members Performing		Tng Emp	Tsk Dif	ATI
			1st Job (N=287)	1st Enl (N=616)			
A2.6.4.30.1	Program Hot Bonder	2b					
Tasks	I0339. Monitor or adjust correct surface temperature of advanced composite repair areas with heat-measuring devices		10	8	2.48	5.33	7
	M0530. Remove antenna coatings		0	0	1.07	5.78	2
A2.17.4	Drilling countersinking of advanced composites	2b					
Tasks	I0326. Countersink advanced composite materials		17	17	2.98	5.20	7
	I0329. Cut, drill, form, and trim thermoset materials		8	7	2.07	5.81	7

Mean TE Rating = 1.96 Standard Deviation = 1.42 High TE = 3.38
Mean TD Rating = 5.00 Standard Deviation = 1.00 High TD = 6.00

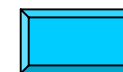


Proficiency Code Requiring Review



Unit	Learning Objective	Prof Code	Percent Members Performing		Tng Emp	Tsk Dif	ATI
			1st Job (N=287)	1st Enl (N=616)			
A2.13.22 Task	Install access doors G0283. Trim and fit aircraft doors or access panels	-	45	55	4.80	5.85	18
A2.16.9 Task	Trim and fit replacement components G0284. Trim and fit aircraft skins	-	51	59	4.93	5.89	18
A2.21.4 Task	Remove/install aircraft maintenance access panels A0044. Remove or replace aircraft panels	-	38	45	2.89	4.71	15

Mean TE Rating = 1.96 Standard Deviation = 1.42 High TE = 3.38
Mean TD Rating = 5.00 Standard Deviation = 1.00 High TD = 6.00





Tasks not Referenced to STS



		Percent Members Performing		Tng Emp	Tsk Dif	ATI
<u>Tasks</u>		1st Job (n=287)	1st Enl (n=616)			
E0153	Double flare tubing	54	60	5.41	5.37	18
F0183	Install or remove camloc receptacles	42	50	3.84	3.71	13
G0263	Perform sealed structural metal skin repairs	44	53	4.84	5.19	18
G0276	Repair drill cracks on sheet metal	55	60	4.25	3.76	13
H0289	Clean damaged fiberglass structural areas with solvents	29	33	3.30	4.12	15
H0296	Inject resin into delaminated skin areas	32	37	3.95	4.47	12
J0383	Remove corrosion mechanically, other than using abrasive media or vacuum blasters	41	46	3.36	4.67	15

Mean TE Rating = 1.96 Standard Deviation = 1.42 High TE = 3.38
Mean TD Rating = 5.00 Standard Deviation = 1.00 High TD = 6.00



Job Satisfaction Indicators (Current vs. Previous Study)



	1-48 Months		49-96 Months		97+ Months	
	2004 (N=616)	2000 (N=468)	2004 (N=348)	2000 (N=198)	2004 (N=621)	2000 (N=696)
Job interesting	85	87	86	88	92	91
Talents well utilized	83	82	80	82	89	87
Training well utilized	88	87	84	88	87	84
Sense of accomplishment	67	71	63	68	77	74
Plan to reenlist	55	39	65	57	70	60



Job Satisfaction Indicators (Across Specialty Jobs)



	Aircraft Structural Maintenance (ASM) Cluster (N=1,280)	Fasteners Cluster (N=193)	Corrosion Control Cluster (N=114)	Low Observables (LO) Cluster (N=107)
Job interesting	91	92	82	76
Talents well utilized	89	86	80	76
Training well utilized	92	92	81	66
Sense of accomplishment	74	76	70	59
Plan to reenlist	72	70	58	64



Job Satisfaction Indicators (Across Specialty Jobs)



	Crew Chief IJ (N=14)	Equipment Support IJ (N=14)	Management IJ (N=116)	Quality Assurance IJ (N=10)
Job interesting	93	79	97	90
Talents well utilized	86	86	91	90
Training well utilized	79	79	88	100
Sense of accomplishment	79	50	80	80
Plan to reenlist	71	43	70	70



Retention Dimensions

First-Term Airmen (N=616)



	Percent Responding	Average
<hr/>		
Planning to Reenlist (N=340)		
Pay and allowances	69	2.51
Job security	68	2.68
Retirement benefits	67	2.67
Bonus or special pay	66	2.53
Medical/dental care for AD member	62	2.59
<hr/>		
Planning to Separate (N=265)		
Military lifestyle	62	2.57
Location of present assignment	41	2.50
Pay and allowances	38	2.42
Recognition of efforts	37	2.42
Esprit de corps/morale	31	2.55

Scale: 1 = slight influence, 2 = moderate influence, 3 = strong influence





Retention Dimensions

Second-Term Airmen (N=348)



	Percent Responding	Average
<hr/>		
Planning to Reenlist (N=225)		
Bonus or special pay	66	2.47
Job security	64	2.71
Pay and allowances	64	2.40
Medical/dental care for AD member	53	2.57
Military lifestyle	48	2.25
Planning to Separate (N=116)		
<hr/>		
Recognition of efforts	55	2.55
Military lifestyle	55	2.38
Esprit de corps/morale	48	2.61
Pay and allowances	46	2.34
Leadership at unit level	45	2.65

Scale: 1 = slight influence, 2 = moderate influence, 3 = strong influence



Retention Dimensions Career Airmen (N=621)



	Percent Responding	Average
<hr/> Planning to Reenlist (N=434)		
Retirement benefits	74	2.65
Pay and allowances	59	2.43
Job security	54	2.61
Military lifestyle	47	2.37
Medical/dental care for AD member	44	2.55
<hr/> Planning to Separate (N=42)		
Recognition of efforts	45	2.63
Esprit de corps/morale	45	2.53
Pay and allowances	43	2.44
Military lifestyle	43	2.44
Work schedule	38	2.00

Scale: 1 = slight influence, 2 = moderate influence, 3 = strong influence



Summary of Results



- Career ladder progression atypical
 - Technical at 3-skill level progressing to more managerial at 9-skill level; however, most 7-skill-level members still in technical jobs
- STS supported by survey data
 - STS provides comprehensive coverage of work performed by career ladder, but review of some items warranted
- Job satisfaction indicators – Fair
 - Slightly lower across all indices and TAFMS groups versus the previous survey
 - Slightly higher reenlistment intentions across all TAFMS groups versus previous study
 - Slightly lower across all indices for Corrosion Control Cluster and Low Observables (LO) Cluster compared to the remaining clusters and IJs
 - Very low for Equipment Support IJ in sense of accomplishment and reenlistment intentions compared to the remaining clusters and IJs



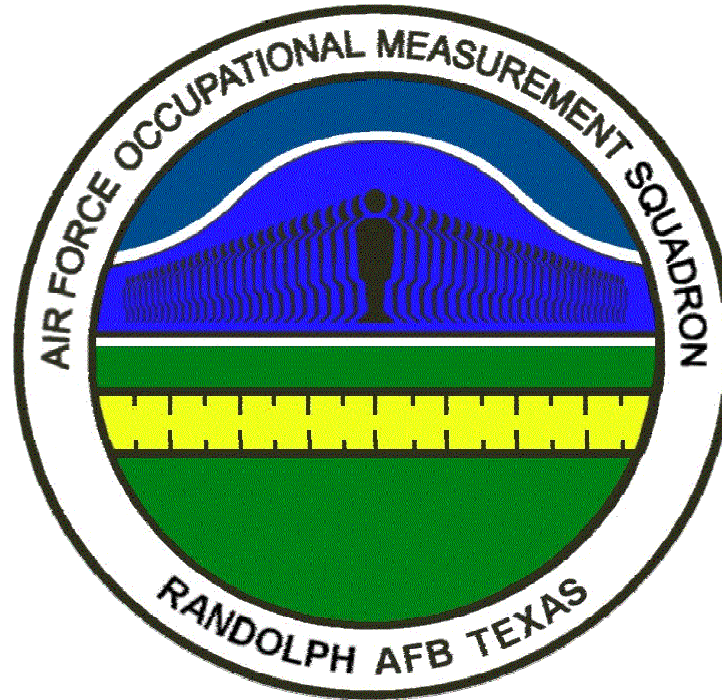
Way Ahead



- OSR Delivery Trip – 14-18 June 2004
- Utilization and Training Workshop (U&TW) – 14-18 June 2004
- Next SKT rewrite (major) – 2 June 2004



Questions?



Visit our web site at:

<https://www-r.omsq.af.mil/OA/oaproducts.htm>

E-Mail: bryan.pickett@randolph.af.mil



Back-Up Slides



Job Survey Background



- Previous JI and OSR
 - JI: 2A7X3 – Apr 00, Lt Hymes
 - OSR: 2A7X3 – Oct 00, Capt Michael
 - Programming Support – Mr. Hill
- Issues from last Post-Analysis Review
 - None



Job Structure Glossary



- **Job:** A group of similar *positions* where incumbents perform many of the same tasks and spend relatively the same amount of time performing these tasks
- **Cluster:** A series or group of related *jobs* which are distinguishable from each other on some variable (weapon system maintained, ratio of supervisory to technical tasks, etc.)
- **Independent Job:** A job that does not fall within any cluster
- **N:** Number in sample



Career Ladder Progression



- “Typical” career ladder progression
 - **3-Skill-Level** apprentices perform a very technical job which include very few administrative/supervisory tasks
 - **5-Skill-Level** journeymen still primarily perform a technical job, but acquire a mix of administrative/supervisory tasks
 - **7-Skill-Level** managers, and above, primarily perform supervisory, managerial, and administrative tasks, with relatively few technical tasks
- “Atypical” career ladder progression
 - **7-Skill-Level** personnel are still spending a significant amount of their total job time performing technical duties, with relatively few administrative/supervisory tasks





Training Document Analysis



- Tasks from job inventory are matched to items in the STS
 - Match is usually conducted with technical school personnel
- Final product provides technical school with data indicating applicability of training documents to work performed in the field in terms of:
 - Percent members performing (PMP) from AETCI 36-2601
 - » 20% PMP for STS
 - TE and TD ratings
- Listing of tasks not referenced to training document also provided
 - May indicate areas where training coverage is lacking





Task Factor Definitions



- **Training Emphasis (TE):** Task list completed by senior NCOs identifying those tasks that should be emphasized for structured training of first-term airmen
- **Task Difficulty (TD):** Task list completed by senior NCOs which rates the relative difficulty of each task to learn
- **Automated Training Indicators (ATI):** Indicators derived from comparing percent performing data with TE and TD data to assist in making training decisions

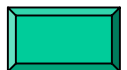




Predictive Retention Indicators



- Military lifestyle
- Pay and allowances
- Bonus or special pay
- Retirement Benefits
- Military related education/Training opportunities
- Off-duty education and training opportunities
- Medical or dental care for active duty member
- Medical or dental care for family members
- Base housing
- Base services
- Childcare needs
- Spouse's career
- Civilian job opportunities
- Equal employment opportunities
- Number of PCS moves
- Location of present assignment
- Number/Duration of TDY's or deployments
- Work schedule
- Additional duties
- Job security
- Enlisted Evaluation System
- Promotion opportunities
- Training/Experience of unit personnel
- Unit manning
- Unit resources
- Unit readiness
- Recognition of efforts
- Esprit de corps/Morale
- Leadership of immediate supervisor
- Senior Air Force leadership



Sustaining the Combat Capability of America's Air Force



Integrity - Service - Excellence